

Table of comparative maximum and minimum temperatures for January.

State or Territory.	Stations.	For 1888.		Since establishment of station.				Length of record.
		Max.	Min.	Max.	Year.	Min.	Year.	
Alabama.....	Mobile.....	72.7	23.0	78.0	1882	11.0	1886	18
Do.....	Montgomery...	76.0	17.5	78.5	1882	5.4	1886	16
Arizona.....	Yuma.....	78.6	27.0	80.0	1879	22.5	1883	13
Do.....	Fort Grant.....	66.6	19.2	77.0	1879	10.0	1883	9
Arkansas.....	Fort Smith.....	71.0	1.2	72.7	1887	-6.9	1886	6
Do.....	Little Rock.....	75.0	7.0	78.0	1880	-4.8	1878	9
California.....	Los Angeles.....	71.0	30.9	82.0	1883	30.0	1880	11
Do.....	San Francisco.....	62.8	28.9	72.9	1887	36.0	1876, 1883	17
Colorado.....	Denver.....	76.0	-20.3	67.0	1882	-29.0	1875	17
Do.....	Pike's Peak.....	35.3	-22.8	30.0	1879	-37.0	1883	15
Connecticut.....	New Haven.....	53.2	4.4	63.0	1876	-14.0	1873	16
Dakota.....	Bismarck.....	40.0	-37.0	49.0	1880	-43.6	1887	14
Do.....	Deadwood.....	.....	.....	62.0	1883	-30.0	1883	11
Dis. of Columbia.....	Washington City.....	53.5	9.2	71.0	1874, 1876	-14.0	1881	18
Florida.....	Cedar Keys.....	77.0	29.3	77.0	1880	15.5	1886	9
Do.....	Pensacola.....	71.0	26.1	73.6	1882	14.9	1886	9
Georgia.....	Augusta.....	77.8	22.6	79.0	1879	6.0	1886	16
Idaho.....	Boise City.....	61.2	-27.8	61.5	1884	-27.0	1883	11
Illinois.....	Chicago.....	72.6	0.3	70.0	1880	-16.0	1884	17
Do.....	Indianapolis.....	59.8	-6.0	69.0	1876	-25.0	1884	15
Indiana Ter.....	Fort Sill.....	71.0	-7.2	75.9	1887	-9.0	1879	10
Iowa.....	Dubuque.....	37.0	-30.5	62.0	1874	-31.5	1887	15
Do.....	Des Moines.....	43.8	-27.4	63.0	1880	-30.4	1884	10
Kansas.....	Dodge City.....	69.0	-18.0	72.9	1887	-20.0	1883	14
Do.....	Leavenworth.....	54.9	-21.1	65.0	1876	-29.0	1873	17
Kentucky.....	Louisville.....	69.0	7.9	71.0	1876	19.5	1884	16
Louisiana.....	New Orleans.....	79.6	28.8	78.0	1879, 1887	15.3	1886	18
Do.....	Shreveport.....	75.5	15.0	78.0	1876, 1880	-1.3	1886	15
Maine.....	Eastport.....	46.8	-12.2	51.0	1874	-20.0	1874	15
Do.....	Portland.....	46.7	-12.3	58.0	1876	-14.7	1887	17
Maryland.....	Baltimore.....	49.6	9.2	71.0	1876	6.0	1881	16
Massachusetts.....	Boston.....	57.0	-6.2	69.5	1876	-13.0	1882	18
Michigan.....	Marquette.....	29.4	-21.2	56.0	1880	-26.0	1881	14
Do.....	Grand Haven.....	40.0	-5.2	57.0	1880	-12.0	1873	16
Minnesota.....	Saint Vincent.....	36.0	-53.5	39.0	1885	-46.0	1885	8
Do.....	Saint Paul.....	34.0	-41.2	49.0	1879	-35.7	1887	17
Mississippi.....	Vicksburg.....	77.8	17.5	80.0	1879	3.1	1886	16
Missouri.....	Saint Louis.....	67.8	-11.5	72.0	1880	-21.5	1884	18
Montana.....	Ft. Assinaboine.....	53.3	-38.0	46.1	1885, 1886	-49.3	1886	8
Do.....	Helena.....	56.5	-41.0	57.0	1885	-34.0	1883	8
Nebraska.....	North Platte.....	66.2	-34.6	70.0	1880	-26.8	1885	14
Do.....	Omaha.....	51.3	-25.2	62.0	1879, 1880	-32.0	1884	16
Nevada.....	Winnemucca.....	49.6	-25.8	57.2	1887	-23.0	1883	9
New Hampshire.....	Mt. Washington.....	.....	.....	42.0	1874	-50.0	1885	17
New Jersey.....	Atlantic City.....	53.4	2.5	64.0	1880	3.0	1875	15
New Mexico.....	Santa Fe.....	57.5	-2.0	76.0	1879	-13.0	1883	16
New York.....	Buffalo.....	49.0	-6.0	65.5	1874	-13.5	1884	16
Do.....	New York City.....	54.2	-1.9	64.0	1876, 1880	6.0	1886	17
North Carolina.....	Charlotte.....	72.8	17.2	71.0	1885	-0.6	1886	10
Do.....	Wilmington.....	75.1	20.0	77.0	1879	9.0	1884	18
Ohio.....	Cincinnati.....	64.2	6.0	69.0	1876	-12.4	1886	18
Do.....	Sandusky.....	54.0	-1.6	64.0	1880	-16.5	1879	11
Oregon.....	Portland.....	62.0	-2.0	60.0	1886	3.0	1875	15

Table of comparative maximum and minimum temperatures, &c.—Cont'd.

State or Territory.	Stations.	For 1888.		Since establishment of station.				Length of record.
		Max.	Min.	Max.	Year.	Min.	Year.	
Do.....	Roseburg.....	71.1	-6.0	66.0	1885	12.0	1883	11
Pennsylvania.....	Pittsburg.....	61.0	3.0	75.0	1874	-12.0	1875	15
Do.....	Philadelphia.....	56.2	2.4	67.0	1876	-5.0	1875	18
Rhode Island.....	Block Island.....	55.0	-3.0	58.8	1885	-4.0	1882	8
South Carolina.....	Charleston.....	76.0	26.0	80.0	1879	-10.5	1886	15
Tennessee.....	Knoxville.....	70.3	12.2	74.0	1876	-16.0	1884	18
Do.....	Memphis.....	74.5	6.2	73.0	1876, 1880	8.0	1886	16
Texas.....	Brownsville.....	77.6	21.4	87.6	1880	18.0	1881	13
Do.....	Fort Elliott.....	77.1	-14.2	81.0	1880	-12.0	1883	9
Utah.....	Salt Lake City.....	52.8	-16.7	54.0	1879	-20.0	1883	14
Virginia.....	Lynchburg.....	73.7	14.0	72.0	1879	-4.0	1877	15
Do.....	Norfolk.....	73.4	16.2	80.0	1871	8.0	1879	18
Washington.....	Spokane Falls.....	51.5	-30.5	51.2	1887	-27.7	1883	7
Do.....	Olympia.....	56.0	-1.8	59.0	1885	9.0	1883	11
Wisconsin.....	La Crosse.....	34.0	-42.0	59.0	1874	-43.0	1873	16
Do.....	Milwaukee.....	36.7	-22.7	59.0	1874, 1874	-25.0	1875	18
Wyoming.....	Cheyenne.....	63.6	-27.2	63.0	1880	-38.0	1875	15

TEMPERATURE OF WATER.

The following table shows the temperature of the sea-water for January, 1888, observed, under conditions as given, at the harbors of the several stations; the monthly range of water temperature; the average depth at which the observations were made, and the mean temperature of the air:

Station.	Temperature at bottom.				Mean temperature of air at the station.	Average depth of water in feet and tenths.
	Max.	Min.	Range.	Monthly mean.		
Canby, Fort, Wash*.....	.....	.....	.....	.....	.....	.....
Cedar Keys, Fla.....	69.5	52.4	17.1	60.5	59.3	7.4
Charleston, S. C.....	55.5	48.5	7.0	51.3	51.0	35.4
Eastport, Me.....	40.4	34.2	6.2	37.0	37.7	16.6
Galveston, Tex.....	58.4	38.8	19.6	49.7	49.8	14.8
Key West, Fla.....	75.2	70.3	5.2	73.7	71.8	18.7
New York City.....	63.4	30.2	6.2	33.3	25.9	13.7
Pensacola, Fla.....	63.6	54.8	8.8	57.7	55.8	17.2
Portland, Me†.....	.....	.....	.....	.....	.....	.....
Portland, Oregon ‡.....	44.6	32.0	12.6	37.5	30.0	56.0

* Not received. † Thermometer out of order. ‡ 21 days; river frozen from 15th to 24th, both inclusive.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for January, 1888, as determined from the reports of about eight hundred stations, is exhibited on chart iv. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departures from the normal. The figures opposite the names of the geographical districts in columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal, and subtracting when above.

In New England, the middle Atlantic and west Gulf states, and in the upper Mississippi, Missouri, and Ohio valleys, the rainfall of January, 1888, was about normal; it was slightly below normal in the Lake region and Rio Grande Valley, and decidedly below in the Florida Peninsula, south Atlantic and east Gulf states. On the Pacific coast the rainfall was above the normal, the most marked excess occurring in southern California, where the normal was exceeded by about 80 per cent. In the south Atlantic and east Gulf states only about 65 per cent. of the normal amount fell, and in the Florida Peninsula less than 20 per cent. of the normal amount fell. In northwestern California the monthly rainfall was very heavy, several voluntary observers in Humboldt county reporting more than 12 inches. Mr. W. H. Roscoe, voluntary observer at Upper Mattole, in the county named, reports a

monthly rainfall of 41.63, of which about 32 is reported to have fallen in the last six days of the month, more than 10 inches being recorded on one day, the 30th. The record from Upper Mattole shows that rain fell daily from the 1st to the 6th and from the 20th to the 31st, also on the 13th and 14th. Concerning this remarkably heavy rainfall, the following extract is given from a communication received from Lieutenant J. B. Maxfield, Signal Corps, San Francisco, Cal.:

This report shows the enormous rainfall of 41.63 inches for the month, a larger rainfall than any contained in the records of this office for points along the coast which ordinarily show a very large rainfall. The rainfall reports for January from stations near Upper Mattole have been examined and they all show an excessive rainfall. There is, therefore, no reason to doubt the correctness of Mr. Roscoe's record. Upper Mattole is in Humboldt county, near the coast, and its topographical surroundings are favorable for a heavy rainfall.

The records at the stations in northwestern California are not of sufficient length from which to compute normals, and, therefore, no comparison can be made, but the rainfall in that region for the month was, doubtless, largely in excess of the average.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for a series of years; (2) the length of record during which the observations have been taken, and from which the average has been computed; (3) the total precipitation for January, 1888; (4) the departures of the current month from the average;

(5) and the extreme monthly precipitation for January during the period of observations and the year of occurrence:

State and station.	County.	(1) Average for the month of Jan.		(2) Length of record.	(3) Total for Jan., 1888.	(4) Departure from average.	(5) Extreme monthly precipitation for January.			
		Inches	Years				Greatest.		Least.	
							Am't.	Year.	Am't.	Year.
Arkansas. Lead Hill	Boone	2.39	6	2.54	+0.15	3.31	1882	1.33	1887	
California. Sacramento	Sacramento	4.24	22	5.37	+1.13	8.70	1875	1.07	1887	
California. Santa Barbara	Santa Barbara	3.70	20	10.15	+6.45	14.84	1875	0.25	1870	
Connecticut. Southington	Hartford	3.82	19	4.53	+0.71	6.47	1874	1.47	1876	
Florida. Merritt's Island	Brevard	2.50	10	0.74	-1.76	6.09	1883	0.57	1884	
Illinois. Goloonda	Pope	3.60	9	3.75	+0.15					
Illinois. Mattoon	Coles	2.42	38	2.65	+0.23					
Illinois. Peoria	Peoria	1.63	32	1.87	+0.24					
Illinois. Riley	McHenry	1.95	27	1.24	-0.71					
Indiana. Logansport	Cass	1.06	34	3.50	+2.44	4.97	1870	0.00	1856	
Indiana. Spiceland	Henry	2.85	28	2.30	-0.55	7.30	1876	1.10	75 '84	
Indiana. Sunman	Ripley	3.79	5	2.83	-0.96	7.48	1885	2.00	1884	
Indiana. Yevay	Switzerland	4.29	21	4.20	-0.09	9.03	1876	1.61	1870	
Iowa. Independence	Buchanan	1.38	12	1.49	+0.11	3.69	1886	0.20	1878	
Iowa. Cresco	Howard	1.31	15	1.74	+0.43					
Iowa. Monticello	Jones	1.65	34	1.13	-0.52	3.77	1866	0.29	1865	
Kansas. Independence	Montgomery	1.52	16	1.28	-0.24	2.69	1878	0.30	1875	
Kansas. Wellington	Sunman	0.71	10	0.65	-0.06	1.54	1886	0.18	1881	
Kansas. Yates Centre	Woodson	1.00	8	1.60	+0.60	1.80	1885	0.19	1881	
Louisiana. Point Pleasant	Tensas	6.78	8	2.30	-4.48					
Louisiana. Grand Coteau	Saint Landry	7.12	6	2.74	-4.42					
Louisiana. Mandeville	St. Tammany	5.88	4	3.27	-2.61					
Louisiana. New Iberia	Iberia	4.70	4	2.39	-2.31					
Maine. Gardiner	Kennebec	3.51	50	5.13	+1.62					
Maryland. Cumberland	Alleghany	2.20	16	3.85	+1.65	3.90	1878	0.30	1887	
Michigan. Kalamazoo	Kalamazoo	2.37	13	1.89	-0.48					
Nevada. Carson City	Ormsby	1.96	9	1.54	-0.42	5.57	1886	0.40	1885	
New Jersey. Moorestown	Burlington	3.49	25	4.44	+0.95	5.82	1882	1.13	1867	
New York. Factoryville	Tioga	2.18	6	2.51	+0.33	3.42	1886	1.20	1887	
New York. Palermo	Oswego	3.31	35	3.53	+0.22	5.30	1874-'84	2.00	1882	
Ohio. North Lewisburg	Champaign	3.63	17	6.15	+2.52	8.67	1876	0.44	1877	
Ohio. Wauseon	Fulton	2.21	14	2.40	+0.19	3.53	1880	1.29	1879	
Ohio. Tiffin	Seneca	2.51	3	2.77	+0.26	3.03	1886	1.75	1879	
Oregon. Albany	Linn	8.21	9	10.71	+2.50	12.58	1887	2.22	1882	
Oregon. Eola	Polk	6.34	18	11.68	+5.34					
Pennsylvania. Corry	Erie	3.59	3	3.32	-0.27	4.61	1886	2.84	1887	
Pennsylvania. Dyberry	Wayne	3.08	19	4.38	+1.30	4.75	1878	0.50	1872	
South Carolina. Stateburg	Sumter	3.72	7	2.14	-1.58	6.04	1885	2.14	1888	
Tennessee. Milan	Gibson	5.66	6	6.03	+0.37	7.50	1885	4.45	1884	
Texas. New Ulm	Austin	4.04	16	2.75	-1.29	10.56	1882	1.09	1887	
Vermont. Strafford	Orange	3.27	13	3.80	+0.53	5.50	1887	1.70	1878	
Virginia. Bird's Nest	Northampton	3.68	19	4.10	+0.42	6.75	1882	1.00	1876	
Virginia. Dale Enterprise	Rockingham	2.52	8	1.92	-0.60	5.90	1886	1.73	1883	
Virginia. Variety Mills	Nelson	4.03	9	2.92	-1.11	6.14	1882	1.58	1880	
Virginia. Wytheville	Wythe	3.56	22	3.25	-0.31	7.08	1882	1.50	1872	
West Virginia. Helvetia	Randolph	5.31	12	4.32	-0.99					

SNOW.

Light or heavy snow fell in some part of the lower lake region on every day during the month, and in all northern districts snow was of frequent occurrence. None fell in the east Gulf states during January, excepting the 2d and 16th in the northern portion; in the west Gulf states it was reported on the 8th, 9th, 12th, 14th to 17th, 23d, and 27th; in the lower Rio Grande valley on the 15th and 16th; in the south Atlantic states on the 12th, 13th, 16th, 17th, 18th, 21st, and 22d. In Dakota, Minnesota, Wisconsin, Michigan, and western New York the heavy snowfalls during the month, with the extremely cold weather, resulted in extensive blockades, which greatly impeded railway traffic. The severest snow storms of the month in the Northwest occurred on the 6-7th and 12-16th, and in western New York on the 26-27th.

MONTHLY SNOWFALLS (in inches and tenths).

In the northern portions of Maine, Vermont, New Hampshire,

and Michigan, in western New York, and in western and north-western Pennsylvania the monthly snowfalls generally ranged from 30 to 50 inches, the largest amount being 59 at Lewiston, Me. With the exception of West Virginia, Maryland, northern Virginia, and portions of Tennessee and Arkansas, the monthly snowfalls were generally less than 4 inches in all districts south of the thirty-seventh parallel to the east of the one hundredth meridian. Reports from stations along the line of the Central Pacific Railway, in Placer and Nevada counties, California, show very heavy snowfalls, but these are not unusual for that region in January.

The following monthly snowfalls of ten inches or more occurred; but in states having less, the maximum amount is also given:

Arizona: Prescott, 13; Fort Apache, 11.6. Arkansas: Little Rock, 11.1. British Columbia: New Westminster, 19. California: Summit, 92; Cisco, 69; Emigrant Gap, 38; Towles, 25; Truckee, 23.5; Colfax, 18; Fort Bidwell, 17.2; Tehachapi, 12; Delta, 10. Colorado: Aspen, 20; Grand Junction, 10. Connecticut: New Hartford, 25.8; Middletown, 21.5; Southington, 19.5; Hartford, 17.1; Waterbury, 15; New Haven, 14.6; New London, 10. Dakota: Webster, 18; Richardton, 17.5; Yankton, 16.8; Bismarck, 11.2. District of Columbia: Washington City, 7.8. Idaho: Boise City, 6.6. Illinois: Oswego, 12.2; Rockford, 12; Chicago, 11.7; Sandwich, 10.5. Indiana: Delphi, 15.3; Angola, 13.2; La Grange, 12.1; Princeton, 11; Columbia City, 10. Indian Territory: Tulsa, 3.5. Iowa: West Bend, 16.9; Des Moines, 14; Davenport, 11.4; Dysart, 10.5; Cresco, 10. Kansas: Cawker City, 7.5. Kentucky: Lexington, 4.1. Louisiana: Coushatta, 7 to 8. Maine: Lewiston, 59.4; Portland, 41.6; Gardiner, 41.5; Bar Harbor and Cornish, 38; Orono, 37.5; Skowhegan, 32.8; Eastport, 21.9. Maryland: New Midway, 12; Cumberland, 11; Fallston, 10.5. Massachusetts: Fitchburg a, 24.5; Gilbertville, 22; Newburyport, 21.5; Fitchburg b, 21.2; Amherst a and Westborough, 19; Amherst b and Deerfield, 18.5; Provincetown, 17.7; Dudley, 16.2; Rowe, 15; Boston, 13.1; Milton, 12.5; Somerset, 11.2; Fall River, 11; Middleborough and Plymouth, 10.5; New Bedford, 10. Michigan: Bear Lake, 67.4; Benzonia, 58; Central Mine, 48; Saint Ignace and Snowflake, 46; Hillman, 44; Buchanan, 38; Traverse City, 37.5; Fletcher and Maple Hill, 34; Grand Rapids, 25.2; Hart, 25; Alpena, 23.9; Cassopolis, 23; Mio and Petersburg, 21; Mackinaw City, 20.7; May, 20.8; Kalamazoo, 20.5; Mottville and Paw Paw, 20; Marquette, 19.8; Pontiac, 19; Grand Haven, 17.9; Grayling, Greenville, and Harrisville, 17.8; Big Rapids, 17.2; Detroit, 16.6; Lansing (signal office) and Escanaba, 16; Jonesville, 15.7; Alma and West Branch, 15.5; Colon, 15.2; Saginaw, 14.8; Corunna, 14.6; Marshall, 14; Lansing (state Capitol), Adrian, and Coldwater, 13.5; Olivet and Williamstown, 13; Madison, 12.7; Pulaski, 12.4; Hastings, 11.8; Hanover and Ovid, 11; Saint John's, 10. Minnesota: Alexandria, 43.8; Ortonville and Excelsior, 39; Tracy, 32; Redwood Falls, 31.6; Fort Ripley, 28; Delano, 25.5; Mankato, 15; Minneapolis, 12.6; Rolling Green, 11; Red Wing, 10. Missouri: Springfield, 6.5. Montana: Fort Maginnis, 27.8; Helena, 12.4. Nebraska: Fremont, 10. Nevada: Fenelon, 33; Carlin, 22; Hawthorne, 20; Battle Mountain, 19; Wells, 17.5; Winnemucca, 13.4; Tecoma, 11.8; Beowowe, 11. New Hampshire: Plymouth, 36.5; Hanover, 34; Manchester a, 33.2; Manchester b, 32.5; Manchester c, 30.8; Antrim, 28; Nashua, 22.8. New Jersey: South Orange, 17; Beverly, 11. New Mexico: Gallinas Spring, 3.2. New York: Utica, 46; Oswego, 44; Palermo, 34.5; Saratoga Springs and North Volney, 26; Auburn, 22; Rochester and Ardenia, 21; Albany, 20.9; White Plains, 20; Menands, 19.2; Humphrey and Buffalo, 19; Le Roy, 18.3; Boyd's Corners, 15; New York City and Brooklyn, 13; Worcester, 12.5; Coopers-town, 11.5; Penn Yan, 10.6. North Carolina: Chapel Hill, 3. Ohio: Jefferson, 18.7; Garrettsville, 15.5; Ruggles, 14; Sidney, 13.5; Wauseon, 13.3; Cleveland a, 12.8; Clarion, 12.5; Bangorville, 12.2; Upper Sandusky, 12; Cleveland b, 11.9; Hanging Rock, 11.6; Napoleon, 11.1; North Lewisburg and Oberlin,

10.5. *Oregon*: Linkville, 24.4; East Portland, 16; Lakeview, 15.8; Roseburg, 15; Portland, 12; Eola, 11.3. *Pennsylvania*: Eagles Mere, 41.3; Allegheny College, 30.5; Somerset, 25.8; Grampian Hills, 20; Blooming Grove, 19; Dyberry, 18.2; State College, 17.2; Wellsborough, 16.9; Easton, 16.8; Hollidaysburg, 16.5; Meadville and Lancaster, 15; Scranton, 14.8; Quakertown, 14.4; Phillipsburg, 14; Reading, 13.5; Indiana, 13.4; Wysox, Chambersburg, and Erie, 13; New Bloomfield, 12.8; Lebanon, 11.9; Huntingdon, 11.7; Greenville, 11.4; Catawissa, 10.8; Germantown, McConnellsburg, and Carlisle, 10.5; Drifton, 10. *Rhode Island*: Providence, 12. *Tennessee*: Nashville, 9.1. *Texas*: Mesquite, 4. *Utah*: Promontory, 27; Corinne, 25; Ogden, 21; Blue Creek, 18; Salt Lake City, 16; Kelton, 15. *Vermont*: Northfield, 53.6; Newport, 45; Strafford, 40; Lunenburg, 30; Chelsea, 28.5; Burlington, 20; Manchester, 19.5. *Virginia*: Rappahannock, 13.8. *Washington Territory*: Spokane Falls, 24.6; Vashon, 23; Blakely, 14.8; Walla Walla, 10.7; Olympia, 10.5. *West Virginia*: Middlebrook, 23; Helvetia, 22.4; Buckhannon, 21. *Wisconsin*: Embarras, 26.9; Fredonia, 20; Manitowoc, 19.2; Deuster, 16.2; Fond du Lac, 16; Green Bay, 15.7; Franklin, 15; Lancaster, 13.5; Milwaukee and Prairie du Chien, 10. *Wyoming*: Camp Sheridan, 39.3.

DEPTH OF UNMELTED SNOW ON GROUND AT END OF MONTH.

[Expressed in inches and tenths.]

Reports show that there was but little snow remaining on the ground at the end of January to the south of the fortieth parallel. To the northward of the parallel mentioned the depth of unmelted snow was generally more than 2; in Dakota, Minnesota, Wisconsin, Michigan, in portions of Pennsylvania, New York, and throughout New England, except along the southern coast, the depth generally ranged from 15 to 50. The greatest depth, 54, was reported from both Central Mine, Mich., and Northfield, Vt. The depth at end of month, as reported from the various states and territories, is as follows:

Arizona: Prescott, trace. *California*: Nicolaus, 1.5. *Colorado*: Grand Junction, 1.5; Pike's Peak, 0.3. *Connecticut*: Middletown, 21.5; New Hartford, 17; Southington, 16; Hartford and Waterbury, 15; New Haven, 6; Voluntown, 4; Thompson Hill, 3; New London, 1. *Dakota*: Richardton, 24; Parkston, 18; Huron, 15; Webster, 12; Fort Totten, 10; Bismarck, 9; Yankton, 4; Fort Sully, 0.5; Rapid City, trace. *District of Columbia*: Kendall Green, 2.5; Washington City, 1. *Illinois*: Oswego, 10; Sandwich, 9; Sycamore, 3; Chicago, 2; Charleston, 0.1. *Indiana*: Logansport, 4.2; Butlerville and Sunman, trace. *Iowa*: Cresco, 26; Bancroft and Ames, 24; Independence, 18 to 24; Monticello, 18; Dysart, 16; Maquoketa and Muscatine, 15; Clear Lake and West Bend, 10; Sac City, 9; Cedar Rapids, 8; Dubuque, 6.5; Oskaloosa, 5 to 8; Clinton, 5; Manson, 4.3; Davenport, 3.8; Albia, 3; Des Moines and Fort Madison, 2; Osceola, drifts. *Kansas*: East Norway, drifts; Wakefield, trace. *Maine*: Lewiston, 45; Cornish, 42; Bar Harbor and Orono, 30; Portland, 26; Gardiner, 25; Skowhegan, 24; Eastport, 10. *Maryland*: Cumberland, 6; Woodstock, 4; Baltimore, 2. *Massachusetts*: Rowe, 32; Deerfield, 20; Amherst, 18; Fitchburg, 15; Westborough, 13; Lowell, 11; Gilbertville and Newburyport, 10; Dudley, 5; Boston and Milton, 3; Plymouth, 2 to 3; New Bedford, Provincetown, and Somerset, 2; Taunton, 1. *Michigan*: Central Mine, 54; Traverse City, 37; Mio and West Bend, 36; Escanaba, 30; Sault Saint Marie, 28; Snowflake, 27; Hart, 25; Benzonia, 24; Bear Lake and Big Rapids, 22; Mackinaw City and Fletcher, 20; Paw Paw, 19; Kalamazoo and Buchanan, 18; Greenville, 17.8; Hillman, 17; Benton Harbor, 15; Grand Haven, 14.8; Alpena, Alma, and May, 14; Cassopolis, Ovid, Lansing (state Capitol), and Saint John's, 12; Grand Rapids and Saint Louis, 11; Bad Axe, Concord, and Williamston, 10; Adrian and Jonesville, 9; Madison, Mount Morris, Hastings, Olivet, Pulaski, and Hudson, 8; Eden and Birmingham, 7; Mottville, Thornville, Highland Station, Coldwater, Hanover, Lansing (signal office), Port Huron, and Detroit, 6; Petersburg, 3. *Minnesota*: Morris, 30; Excelsior, 29; Glenwood, 28; Red Wing, 27;

Delano, 26; Duluth, 20; Saint Paul, 17; Mankato, 15; Moorhead, 10; Saint Vincent, 7; North Loup, trace. *Missouri*: Frankford, 2. *Montana*: Poplar River, 6; Fort Custer, 1. *Nebraska*: De Soto, 2; Hay Springs, Falls City, and Weeping Water, drifts; Crete, trace. *New Hampshire*: Hanover, 40; Manchester a, 30; Manchester b, 24; Nashua and Plymouth, 15. *New Jersey*: South Orange, 6; Beverly, 3; Moorestown, 2.5; Atlantic City, 2; Clayton, 1; Egg Harbor City and Vineland, 0.8. *New York*: Syracuse, 36; Palermo, 31; Auburn, 27; Utica, 23; Albany and North Volney, 20; Oswego, 18; Le Roy, 16; Humphrey, 14; Menands, 13; Penn Yan, 12; Factoryville, 9; Cooperstown and Rochester, 8; Buffalo, Friendship, White Plains, and Ithaca, 6; Boyd's Corners, 5; Brooklyn, 3; Setauket, 2; Ardenia and New York City, 1. *Ohio*: Hiram, 6; Garrettsville, 5; Wauseon, 4; Cleveland a, Lordstown, Napoleon, and Ruggles, 3; Toledo, 2.2; Cleveland b, Sandusky, and Tiffin, 2; Greenville, 1. *Pennsylvania*: Dyberry, 25; Blooming Grove, 20; Wellsborough 14.2; Driftou and Grampian Hills, 14; Corry, 12; Germantown, 10.5; Quakertown, 8; Reading, 7; Catawissa, 6; Erie and Westtown, 4; Phillipsburg, 3; Philadelphia, 2; Pittsburg, 1. *Rhode Island*: Providence, 1 to 2. *Utah*: Fort du Chesne, 3. *Vermont*: Northfield, 54; Chelsea, 38; Newport, Lunenburg, and Strafford, 36; Burlington and Manchester 30. *Virginia*: Rappahannock, 3; Petersburg, 0.5; Dale Enterprise, University of Virginia, and Wytheville, trace. *West Virginia*: Middlebrook, 6. *Wisconsin*: Fredonia, 40; Manitowoc, 36; Green Bay, 35; Deuster, 26; Lancaster, 24; Fond du Lac, 19; La Crosse, 18; Madison, 17; Prairie du Chien, 14; Milwaukee, 11. *Wyoming*: Camp Sheridan, 3.5; Fort Washakie, 1.

SLEET.

During the month sleet was of common occurrence in the Northern and Western States, being more frequent in the first half than in the second half of the month. In the Gulf States sleet fell on the 8th, 9th, 12th, 14th to 16th, 19th.

Excessive precipitation for the month of January, 1888.

States and stations.	Monthly, 6 inches, or more.	Specially heavy.					
		2 inches, or more, per day.			At rate of 1 inch, or more, per hour.		
		Am't.	Duration.	Date.	Am't.	Duration.	Date.
<i>Alabama.</i>							
Selma	11.50						
Gadsden	9.53						
Valley Head		3.00		16			
<i>British Columbia.</i>							
New Westminster	7.11						
<i>California.</i>							
Upper Mokole *	41.63	4.50					
Do		31.68		27 to 31			
Emigrant Gap	17.00						
Hydesville	14.81	8.86		28 to 31			
Colfax	13.28						
Eureka	12.95	3.91	24 00				
Fort Gaston	12.58	3.10			30		
Do		4.60		27, 28, 29			
Georgetown	12.50						
Delta	10.49						
Santa Barbara	10.11						
Cisco	9.75						
Summit	9.20						
Santa Cruz	8.00						
Calistoga	7.87						
Oroville	7.72	2.14				2	
Presidio of San Francisco	7.18						
Auburn	7.07						
Santa Monica	6.98						
San Francisco	6.81						
Alcatraz Island	6.76	2.10				3	
Newhall	6.74						
E. Pasadena	6.55	4.95		3 to 5			
Oakland	6.47						
Anaheim	6.29						
Trapico	6.25						
Spadra	6.23						
Mason	6.11	2.38				1, 2	
Templeton	6.05						
Los Angeles	6.04	3.39	19 15			3, 4	
Benicia Barracks		2.16				2, 3	
Riverside		2.31	10 30				
Lewis Creek		2.45				4	
<i>Connecticut.</i>							
Hartford	7.68	4.44	18 00			1	
Voluntown	6.75	2.90				1, 2	
Southington		2.20				1, 2	

Table showing for the month of January, &c.—Continued.

States and stations.	Rainfall of 10 inches, or more, per month.		Rainfall of 2.50 inches, or more, in 24 hours.			Rainfall equaling or exceeding one inch per hour.			
	Year.	Amt.	Year.	Day.	Amt.	Year.	Day.	Time.	Amt.
<i>Tennessee.</i>									
Chattanooga	1882	14.74	1879	8-9	2.77				
Do			1879	11-12	3.32				
Do			1882	15-16	2.92				
Do			1886	2-3	3.04				
Do			1887	23-24	3.54				
Knoxville	1882	16.98	1875	28-29	3.63				
Do			1879	8-9	3.63				
Do			1879	11-12	3.30				
Do			1879	16-17	2.51				
Do			1882	20-21	2.74				
Do			1882	28	2.94				
Do			1883	28	2.54				
Memphis	1882	12.87	1872	15-16	3.50				
Do			1875	1-3	2.53				
Do			1875	27-28	3.96				
Do			1880	16-17	2.92				
Do			1882	16-17	3.06				
Do			1887	22-23	3.08				
Nashville	1882	14.51	1882	12-13	2.77				
<i>Texas.</i>									
Clarksville	1875	12.25	1874	22	2.50				
Do			1874	31	4.00				
Do			1875	21	6.50				
Galveston			1877	21	3.61	1879	31	1 05	1.47
Do			1883	5-6	3.48				
Do			1885	15-16	3.04				

Table showing for the month of January, &c.—Continued.

States and stations.	Rainfall of 10 inches, or more, per month.		Rainfall of 2.50 inches, or more, in 24 hours.			Rainfall equaling or exceeding one inch per hour.			
	Year.	Amt.	Year.	Day.	Amt.	Year.	Day.	Time.	Amt.
<i>Utah.</i>									
Coalville			1875	14-15	2.70				
Mount Carmel			1874	3	4.00				
Do			1874	15	4.00				
Do			1874	20	3.00				
<i>Virginia.</i>									
Lynchburg			1885	23	6.32				
<i>Washington.</i>									
Canby, Fort	1887	11.91							
Catalamet	1874	14.53							
Neah Bay	1874	30.50							
Do	1879	13.93							
Do	1884	15.50							
Do	1885	17.70							
Do	1886	16.40							
Do	1887	22.30							
Olympia	1880	19.69							
Pysht	1884	11.29							
Do	1885	14.31							
Do	1886	11.44							
Do	1887	13.76							
Tatoosh Island	1884	13.32	1884	10-11	4.06				
Do	1885	14.47	1884	11-12	4.00				
Do	1886	16.82	1885	5-6	3.43				
Do	1887	14.46	1885	6-7	3.40				
Do			1885	29-30	2.62				

WINDS.

The most frequent directions of the wind during January, 1888, are shown on chart ii, by arrows flying with the wind. In the upper Mississippi, Missouri, Ohio, and Saint Lawrence valleys, Lake region, and in the states bordering on the Atlantic, the most frequent directions were generally westerly or northwesterly; along the Gulf coast, northerly; on the Pacific coast and in the Rocky Mountain regions, variable.

HIGH WINDS (in miles per hour).

The maximum velocities of wind for January, 1888, at Signal Service stations where the movements are registered,

are given in the table of miscellaneous meteorological data. Other than the maximum velocities given in the table referred to, the following velocities of fifty, or more, miles per hour have been reported: Pike's Peak, Colo.,* 84, nw., 1st; 84, w., 2d; 80, w., 3d. Buffalo, N. Y., 50, w., 10-11th. Fort Totten, Dak., 50, s., 11th. Huron, Dak., 50, nw., 13th. Fort Canby, Wash., 52, s., 22d; 54, s., 26th; 68, s., 28th; 54, s., 29th. Tatoosh Island, Wash., 54, s., 25th; 53, se., 27th; 51, s., 28th. Wood's Holl, Mass., 50, w., 26th.

* At Pike's Peak, only, velocities exceeding seventy-five miles are given.

INLAND NAVIGATION.

ICE IN RIVERS AND HARBORS.

Frenchman's Bay.—Bar Harbor, Me.: there was much ice in the bay during latter part of month; navigation closed 28th.

Casco Bay.—Portland, Me.: the harbor was frozen over with thin ice from the 24th to the 28th, making navigation difficult. During the storm of the 26th the bay was completely filled with ice, rendering navigation impossible.

Boston Harbor.—Boston, Mass.: the harbor was almost entirely frozen over on the 23d.

Holmes Hole Harbor.—Vineyard Haven, Mass.: the harbor was frozen over from the 17th to the 23d.

Nantucket Harbor.—Nantucket, Mass.: the harbor froze over on the 21st, closing navigation.

Wood's Holl Harbor.—Wood's Holl, Mass.: the harbor was blockaded with ice and frozen solid to Nantucket Island on 21st. Buzzard Bay was also frozen for several hundred yards from the shore; all navigation was temporarily suspended on the above date.

Edgartown Harbor.—Edgartown, Mass.: the harbor froze over on the 24th and remained frozen to the end of month.

New Haven Bay.—New Haven, Conn.: the harbor froze over on the 17th.

Lake Champlain.—Burlington, Vt.: the lake froze over on the 22d, seven days earlier than the average date for the last seventy years.

East and North rivers.—New York City: floating ice in both

rivers on the 3d; East River was choked with ice on the 19th, 28-29th. There was an unusual amount of drift ice in the upper bay on the 23d.

Seneca Lake.—Starkey, Yates Co., N. Y.: on the morning of the 22d the lake was frozen over. It rarely occurs that this lake freezes over before February.

North Branch Susquehanna River.—Catawissa, Columbia Co., Pa.: river opened on the 2d and closed again on 20th.

Chesapeake Bay and Baltimore Harbor.—Baltimore, Md.: ice in bay and harbor rendered navigation difficult on 23d, 24th, and 25th; winds cleared the harbor of ice on the 26th.

Kitty Hawk Bay.—Kitty Hawk, N. C.: navigation closed 30th.

Alleghany and Monongahela rivers.—Pittsburg, Pa.: floating ice in both rivers on 1st, 3d to 8th, 22d to 24th, 27th to 29th, and in Alleghany River from 9th to 21st, 23d, 25th, 26th; on the 2d ice carried away a span of the 30th street bridge.

Ohio River.—Portsmouth, Scioto Co., Ohio, 31st: there was more or less floating ice in river during the entire month, and much of the time it was so heavy as to prevent navigation.

Louisville, Ky.: floating ice on 3d rendered navigation dangerous; navigation suspended from 21st to 25th, and 27th, 28th; Cairo, Ill.: floating ice from 17th to 21st.

Mississippi River.—The Mississippi was frozen throughout the month at Keokuk, Iowa, and to the northward.

Saint Louis, Mo.: a rapid rise in river occurred on the 23d, caused by an ice dam at Carondelet, a few miles south.